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টঙ্গি-আশুলিয়া সড়কের বস্তিবাসি মহিলাদের পুষ্টিমান মূল্যায়ন

Benchmarking the Nutritional Status of Women in the Tongi-Ashulia Road Slums

by John Richards
Afifa Shahrin
Karen Lund

CENTRE FOR POLICY RESEARCH
IUBAT

IUBAT—International University of Business Agriculture and Technology
Dhaka, Bangladesh

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KAREN LUND is a medical microbiologist, and is the architect and Chair of the BSN Nursing Program at IUBAT. She organized the diet survey that serves as the basis for this report

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A group portrait of some IUBAT Nursing College students and faculty in front of the main IUBAT campus building. Co-author, Dr. Karen Lund, is standing at the far right of the photograph. ALEX BERLAND PHOTO

Foreword

I AM PLEASED TO PRESENT THIS MAJOR PUBLICATION OF THE IUBAT CENTRE FOR Policy Research. It offers valuable survey findings of dietary conditions among shanty dwellers living nearby the IUBAT permanent campus at Uttara.

It is the first publication drawing on research undertaken by students of the IUBAT College of Nursing. In the future, as they pursue their chosen career, I hope they maintain an active interest in practical health-related research.

The study marks a first step in what I hope will be an ongoing IUBAT engagement with the health issues of our neighbors in Uttara Model Town.

— Dr. M. Alimullah Miyan
Vice-Chancellor and Founder, IUBAT

Executive summary

IN THIS MONOGRAPH WE REPORT THE RESULTS OF A NUTRITION SURVEY conducted in early 2010 among families living in the shanty communities in the Abdullapur/Kamarpara area near the Tongi-Ashulia road. This is a neighbourhood in northern Dhaka, close to the Turag River. The survey was conducted among a sample of 120 married women, by nursing students at IUBAT—International University of Business Agriculture and Technology.

In assessing how to improve people's health – particularly in the case of a developing country – the simpler reforms deserve usually more attention than they receive. Among the "simple things" to get right is nutrition.

There is a general consensus from studies conducted in Bangladesh as to the nature of the country's nutritional problems. Here we summarize:

- Among the "ultra poor" the majority experience inadequate caloric intake.
- Those in our survey are poor – but are not "ultra poor." Among such people, the majority have an adequate caloric intake. However, an unduly high percentage of the calorie intake among the poor derives from cereals, primarily rice.
- Diets among the poor typically lack adequate quantities from the full range of food groups. This lack leads to inadequate intake of necessary micronutrients (minerals and vitamins), which in turn stunts growth and increases the risk of succumbing to numerous non-communicable diseases.
- Basic dietary knowledge among many in Bangladesh, rich and poor, is weak. Among the poor this lack is particularly acute.

The typical shanty diet lacks the vitamins and micronutrients found in fresh vegetables and fruits, without which children's physical and mental growth may be stunted. ALEX BERLAND PHOTO

While the majority of respondents have an adequate caloric intake given their activity levels, an adequate calorie intake does not mean an adequate diet. The key conclusion to take from this survey is that most respondents lack adequate servings from the full range of food groups.

For 12 percent of the sampled women, their Body Mass Index (BMI) scores are below the floor of the optimum range. For 67 percent, BMI scores are within the optimum range; for 21 percent, scores imply the respondents are overweight.

We assessed the quality of respondents' diets, applying a simple ten-question instrument developed by the World Health Organization to a 24-hour diet recall. Fully 85 percent of respondents consumed adequate servings from the cereals and potatoes group. Similarly large percentages consumed adequate servings of meat or alternatives. Sixty-two percent consumed fats and sugars within acceptable limits, but the remainder consumed excessive servings from this group. The question on snacks also targets excessive fat consumption, via consumption of *halka* (snack) foods. Here the distribution of responses was reassuring: 87 percent were scored as consuming primarily healthy snacks.

The remaining questions addressed diet inadequacies among respondents. Even with generous scoring, the proportion with adequate servings of milk products was only 12

percent. Only 32 percent had an adequate number of fruit and vegetable servings. Only 38 percent achieved a satisfactory score by consuming two fresh vegetables, albeit another 38 percent consumed one fresh vegetable. A very small share, 6 percent, consumed at least one fresh fruit. Finally, only 33 percent consumed a satisfactory variety within each of three food groups ([1] cereals and potoatoes, [2] fruits and vegetables, and [3] meat, fish, eggs, and daal).

The principal source of water is tap water provided by the Dhaka Water Supply and Sewerage Authority (WASA). Due to contamination from ground water, tap water may contain unacceptably high levels of pathogens. Water from tube wells should be free from pathogens in ground water, but it poses the long-term danger of arsenic poisoning in many places in Bangladesh. For drinking, 16 percent of families use boiled WASA water, 15 percent water from tube wells. The majority, 69 percent, rely on unboiled WASA water, a non-sanitary option.

Tobacco and betel nut are widely used among shanty residents: the majority of husbands smoke *bidi*; the majority of wives chew *paan*. One reason for widespread use is that the prices of both are very low in Bangladesh relative to many countries. Both pose serious health hazards if consumed on a long-term basis.

In assessing factors that may influence nutritional decisions, we found that two have a statistically significant impact on at least some decisions: the ability to read, and receiving one-on-one advice from a health worker.

Women who can read are less than half as likely to chew *paan* as those who cannot. There is no evidence that a woman's husband chewing *paan* induces her to do likewise. Receiving nutritional advice implies some impact on lowering the probability of chewing, but such advice is not statistically significant. In explaining the probability that the respondent uses safe drinking water, the only statistically significant explanatory factor is receiving advice from a health worker. In the matter of the respondent's food score the one statistically significant impact is again advice from a health worker. Those respondents receiving such advice had, on average, a score that was 0.4 point higher than those who did not.

This study is a benchmark at a point of time, in early 2010. We hope to undertake subsequent studies in the same community. It is only by tracking changes in nutritional status over time that it becomes possible to draw solid conclusions about whether the community's nutritional status is improving. Nonetheless, there are conclusions worth making from this study.

1. The role of advice from health workers

Among all sources of advice on diet and use of sanitary drinking water, the one source of advice to have a statistically significant influence among those surveyed was that from health workers visiting the respondents' homes. Advice from other sources (such as family members, posters, meetings and media campaigns) may matter but overall we could not detect a statistically significant impact. These results suggest that allocating trained health workers to undertake

An IUBAT nursing student interviews shanty dwellers. Obtaining safe drinking water is not easy. Tap water may be contaminated by ground water. Deep tube wells may contain arsenic. ALEX BERLAND PHOTO

one-on-one counseling is probably a good use of personnel time, both by government health authorities and concerned NGOs.

2. Obtaining a healthy diet at minimum cost

There has been high inflation and volatility of food prices over the last five years. Local health agencies could undertake the exercise of costing alternate nutritional diets on a regular basis and, using current prices, offer advice to families on how best to maintain – and improve – dietary quality at minimum cost.

3. The benefits of education

Achieving higher education levels has major benefits, only some of which relate to nutrition. Adults with higher education levels have higher average incomes; one consequence of higher incomes is the ability of families to afford a superior quality of diet. It is also worth emphasizing the direct link we found between literacy and chewing *paan*. The proportion who chew among those who can read is less than half that among those who cannot.

সার সংক্ষেপ

ঢাকা শহরের টঙ্গী আশুলিয়া সড়কের নিকটবর্তী আব্দুলাপুর/কামারপাড়া এলাকার বস্তীবাসী পরিবারের খাদ্য ও পুষ্টির উপরে ২০১০ সালের প্রথম দিকে পরিচালিত একটি পুষ্টি জরিপের ফলাফল এই সমীক্ষায় তুলে ধরা হয়েছে। ঢাকা শহরের উত্তর প্রান্তে তুরাগ নদীর নিকট এই এলাকাটি অবস্থিত। আইইউবিএটি—ইন্টারন্যাশনাল ইউনিভার্সিটি অফ বিজনেস এগ্রিকালচার এণ্ড টেকনোলজি-এর নার্সিং শিক্ষার্থীরা ১২০ জন বিবাহিত মহিলার উপর এই নমুনা জরিপটি পরিচালনা করে।

জনস্বাস্থ্য উন্নয়নের কৌশল মূল্যায়নে অনেক ক্ষেত্রেই, বিশেষ করে উন্নয়নশীল দেশে সহজ সংস্কারজনিত বিষয়গুলিকে উপযুক্ত গুরুত্ব দেওয়া হয় না। এমন একটি সহজ বিষয় হলো পুষ্টি।

বাংলাদেশে পরিচালিত বিভিন্ন গবেষণা পর্যালোচনা করলে দেশের পুষ্টিজনিত সমস্যার প্রকৃতি সম্বন্ধে ঐক্যমত দেখা যায়। ঐক্যমতের বিষয়াদির সারাংশ নিম্নরূপঃ

- হত দরিদ্র জনগোষ্ঠীর বড় অংশই তাদের খাদ্য থেকে পর্যাপ্ত পরিমাণে ক্যালরী পাচ্ছে না।
- আমাদের গবেষণায় অন্তর্ভূক্ত মহিলারা গরীব তবে হত দরিদ্র্য শ্রেণীর নয়। অধিকাংশই পর্যাপ্ত ক্যালরী পাচ্ছে। তবে এই দরিদ্র জনগোষ্ঠীর ক্যালরীর বড় উৎস হল খাদ্যশস্য, প্রধানত চাল।
- দরিদ্র মানুষের দৈনন্দিন খাবারে সাধারণত সব শ্রেণীর খাদ্যের সমাহার প্রয়োজনীয় পরিমাণে থাকে না। এই সমাহারের অভাবে খাবারে ভিটামিন ও খনিজ পদার্থের অপর্যাপ্ততা দেখা দেয় যা মানুষের দেহের বৃদ্ধিকে বাধাগ্রস্ত করে এবং নানা রকম অসংক্রামক রোগের ঝুঁকি বাড়িয়ে দেয়।
- ধনী-দরিদ্র নির্বিশেষে বাংলাদেশের জনগণের পুষ্টি বিষয়ক সাধারণ জ্ঞানের অভাব রয়েছে। দরিদ্রদের ক্ষেত্রে এই সমস্যা আরো প্রকট।

যদিও জরিপে অংশগ্রহণকারীরা বেশির ভাগই তাদের ক্রিয়াকর্মের নিরিখে শরীরের জন্য প্রয়োজনীয় ক্যালরীটুকু পাচ্ছে, তবে পর্যাপ্ত ক্যালরীর মাধ্যমে সুষম খাবার পাচ্ছে তা বলা যায় না। জরিপের একটি প্রধান উপসংহার হল যে অধিকাংশ উত্তরদাতার খাবারে সব শ্রেণীর খাদ্যের সমাহার পর্যাপ্ত পরিমানে দেখা যায় না।

জরিপে প্রাপ্ত তথ্য থেকে দেখা যায় যে, এই মহিলাদের ১২ শতাংশেরই 'ওজন-উচ্চতার সূচক' (Body Mass Index) কাম্যব্যাপ্তির (optimum range) এর সীমার নীচে। ৬৭ শতাংশের ওজন উচ্চতার সূচক কাম্যব্যাপ্তির মধ্যে, আর বাকী ২১ শতাংশের ক্ষেত্রে এ সূচক মহিলাদের ওজনের মাত্রাতিরিক্ততার প্রতিফলন।

উত্তরদাতা মহিলাদের খাবারের গুণগত মান বিচার করার জন্য আমরা বিশ্ব স্বাস্থ্য সংস্থা কর্তৃক প্রণীত ২৪ ঘন্টা পূর্বের খাবারের তথ্য

সংগ্রহের ১০টি প্রশ্ন বিশিষ্ট একটি প্রশ্নপত্র ব্যবহার করি। জরীপে প্রাপ্ত তথ্য হতে দেখা যায় যে শতকরা ৮৫ ভাগ মহিলাই পর্যাপ্ত পরিমাণে শস্য ও আলু শ্রেণীর খাবার খাচ্ছে। একইভাবে অধিকাংশ উত্তর দাতাই পর্যাপ্ত পরিমাণে মাংস বা তার বিকল্প কিন্তু একই শ্রেণীর খাদ্য গ্রহণ করে। গ্রহণযোগ্য মাত্রায় চর্বি ও চিনি জাতীয় খাবার খাচ্ছে ৬২ শতাংশ যদিও বাকীরা অতিরিক্ত চর্বি এবং চিনি জাতীয় খাবার খেয়ে অভ্যস্ত। হালকা নাস্তা খাওয়ার মাধ্যমে অত্যাধিক চর্বি গ্রহণের বিষয়টি পর্যালোচনা করা হয়। তবে এই প্রশ্নের উত্তর আশংকামুক্ত ছিল কারণ ৮৭ শতাংশ উত্তর দাতা অতিরিক্ত তেল-চর্বিমুক্ত মোটামুটি স্বাস্থ্যকর হালকা-নাস্তা খায় বলে জানায়।

বাকি প্রশ্নগুলির মাধ্যমে উত্তর দাতাদের খাবারের পর্যাপ্ততা সম্পর্কে তথ্য সংগ্রহ করা হয়। নিবিড়ভাবে পরীক্ষা না করেও দেখা যায় যে, কেবলমাত্র ১২ শতাংশ মহিলা যথেষ্ট পরিমাণে দুধ ও দুগ্ধজাতীয় খাবার খায়। শুধুমাত্র ৩২ শতাংশ মহিলার খাবারে প্রয়োজনীয় শাকসবজি ও ফল থাকে। শাকসবজির ক্ষেত্রে দেখা গেছে ৩৮ শতাংশ দুই প্রকারের এবং ৩৮ শতাংশ এক প্রকারের তাজা শাকসবজি খাচ্ছে। মাত্র ৬ শতাংশ মহিলা অন্ততঃ একটি তাজা ফল খায়। সর্বশেষ দেখা যায় যে শুধুমাত্র ৩৩ শতাংশ উত্তর দাতা সন্তোষজনক পর্যায়ে তিনটি শ্রেণীর খাদ্য গ্রহণ করে থাকে। যথাঃ (১) শস্যাদি ও আলু, (২) ফল ও শাকসবজি এবং (৩) মাছ, মাংস, ডিম ও ডাল।

পানির প্রধান উৎস হল পাইপের মাধ্যমে পানি ও পয় কর্তৃপক্ষ (WASA) এর পানি। ভূ-পৃষ্ঠের পানি দূষণের কারণে ওয়াসার পানিতে আশংকাজনক মাত্রায় রোগ-বালাইয়ের জীবানু থাকতে পারে। টিউবওয়েলের পানি এ ধরণের জীবানুমুক্ত হলেও বাংলাদেশের অধিকাংশ অঞ্চলের টিউবওয়েলে দীর্ঘমেয়াদে আর্সেনিক বিষক্রিয়ার আশংকা রয়েছে। সমীক্ষায় অংশগ্রহণকারী পরিবারগুলোর ১৬ শতাংশ

আর ১৫ শতাংশ পান করে টিউবওয়েলের পানি। কিন্তু বেশীরভাগ পরিবার, ৬৯ শতাংশ অস্বাস্থ্যকর ওয়াসার পানি কোন প্রকারের বিশুদ্ধিকরণ ছাড়াই পান করে।

বস্তিবাসী পরিবারের সদস্যদের মধ্যে তামাক ও পান-সুপারীর ব্যাপক ব্যবহার পরিলক্ষিত হয়। অধিকাংশ স্বামী বিড়ি দিয়ে ধুমপান করে এবং অধিকাংশ মহিলারা পান-সুপারী খায়। এই দ্রব্যগুলির ব্যাপক ব্যবহারের একটি কারণ হতে পারে যে অনেক দেশের তুলনায় এইগুলির মূল্যমান বাংলাদেশে খুবই কম। দীর্ঘ মেয়াদীভাবে সেবন করলে এই দুইটিই মারাত্মক স্বাস্থ্য ঝুঁকির কারণ হয়ে দাঁড়ায়।

পুষ্টিগত সিদ্ধান্তের ক্ষেত্রে কি কি বিষয় প্রভাব রাখতে পারে তা বিশ্লেষণ করে দেখা যায় যে দুইটি বিষয় যথাঃ পড়তে পারার ক্ষমতা এবং স্বাস্থ্যকর্মীর কাছ থেকে প্রাপ্ত প্রত্যক্ষ উপদেশ সবচাইতে বেশী প্রভাবশালী।

অশিক্ষিত মহিলার তুলনায় শিক্ষিত মহিলার পান খাওয়ার সম্ভাবনা শতকরা অর্ধেক। তবে স্বামীদের পান-সুপারীর অভ্যাস তাদের স্ত্রীদের একই অভ্যাসে প্রভাবিত করে কিনা সে বিষয়ে কোন প্রমাণ পাওয়া যায়নি। স্বাস্থ্যকর্মীদের কাছ থেকে পুষ্টি বিষয়ে প্রত্যক্ষ উপদেশ পেয়েছে এমন মহিলাদের পান-সুপারী গ্রহণের প্রবণতা কম হতে পারে এই ধারণা করা হলেও পরিসংখ্যানিক বিশ্লেষণে ইহার কোন যথার্থতা পাওয়া যায়নি। তবে উত্তর দাতাদের নিরাপদ পানি ব্যবহার করতে স্বাস্থ্যকর্মীদের প্রত্যক্ষ উপদেশই একমাত্র প্রভাব রেখেছে বলে প্রমাণিত হয়েছে। উত্তর দাতাদের সুষম খাদ্য অভ্যাসের উপর যে প্রভাবটি পরিসংখ্যানগতভাবে তাৎপর্যপূর্ণ দেখা গেছে তা হল স্বাস্থ্যকর্মীর কাছ থেকে প্রাপ্ত প্রত্যক্ষ উপদেশ। দেখা গেছে যে স্বাস্থ্যকর্মীদের কাছ থেকে উপদেশ প্রাপ্তদের খাদ্য-স্কোর (food-score), যারা এই উপদেশ পায়নি তাদের তুলনায় ০.৪ পয়েন্ট বেশি।

খাদ্য-স্কোর (food-score), যারা এই উপদেশ পায়নি তাদের তুলনায় ০.৪ পয়েন্ট বেশি।

বর্তমান জরিপটি ২০১০ সালের শুরুর দিকের একটি নির্দিষ্ট সময়ে করা হয়েছে। একই গবেষণা আমরা পরবর্তী বছরগুলোতে একই জনগোষ্ঠীর উপরে পরিচালনা করার আশা রাখি। একটি জনগোষ্ঠীর পুষ্টিগত উন্নতি সম্বন্ধে সুনির্দিষ্ট উপসংহারে আসতে হলে দীর্ঘ সময় ধরে পুষ্টিগত অবস্থান পর্যবেক্ষন করার প্রয়োজন হয় এবং বিভিন্ন সময়ের পুষ্টিগত মাত্রার পরিবর্তনগুলি পর্যালোচনা করেই এই ব্যাপারে সঠিক সিদ্ধান্তে উপনীত হওয়া যায়। তবে আমাদের গবেষণা থেকে কতগুলি বিষয় উঠে এসেছে যা প্রনিধানযোগ্যঃ

১। <u>স্বাস্থ্যকর্মীদের কাছ থেকে প্রাপ্ত উপদেশের ভূমিকাঃ</u>

পুষ্টিগত খাদ্য ও বিশুদ্ধ পানি ব্যবহারের উপর উপদেশ প্রদানকারী উৎসগুলির মধ্যে যে উৎসটি এই গবেষণায় পরিসংখ্যানিকভাবে তাৎপর্যপূর্ণ পর্যায়ে প্রভাবশালী বলে পাওয়া গেছে তা হল স্বাস্থ্যকর্মীদের উত্তরদাতাদের ঘরে ঘরে গিয়ে দেওয়া প্রত্যক্ষ উপদেশ।

অন্যান্য উৎস যেমন পরিবারের অন্যান্য সদস্য, প্রচারপত্র, সভা-সমিতি ও গণ যোগাযোগ মাধ্যমে পাওয়া উপদেশ হয়ত কিছুটা ভূমিকা রাখতে পারে, তবে এই গবেষণায় আমরা এর কোন পরিসংখ্যানিক তাৎপর্যপূর্ণ প্রভাব পাই নাই। এই উপসংহারের ভিত্তিতে বলা যায় যে, সরকার, স্বাস্থ্য কর্তৃপক্ষ ও বেসরকারী সংস্থাগুলির প্রশিক্ষণপ্রাপ্ত স্বাস্থ্যকর্মীদের সময়ের সবচাইতে উত্তম ব্যবহার হবে প্রতিটি ঘরে ঘরে গিয়ে প্রত্যক্ষ উপদেশ প্রদান।

২। নূন্যতম মূল্যে স্বাস্থ্যসম্মত খাদ্য প্রাপ্তিঃ

বিগত পাঁচ বছরে বাংলাদেশে উচ্চ হারে মুদ্রাস্ফীতি এবং খাদ্য মূল্যের অস্থিরতা পরিলক্ষিত হয়। স্থানীয় পর্যায়ে যে স্বাস্থ্য সংস্থাগুলি আছে তারা নিয়মিতভাবে বিকল্প পুষ্টিসম্মত খাবারের ব্যয় নির্ণয় করতে পারে। এবং প্রচলিত বাজার দরের নিরিখে কিভাবে নূন্যতম ব্যয়ে পরিবারগুলি পুষ্টিমান রক্ষা বা বৃদ্ধি করতে পারে সে বিষয়ে পরামর্শ দিতে পারে।

৩। শিক্ষার উপকারিতাঃ

শিক্ষার হার উচ্চ পর্যায়ে উন্নীত করার মাধ্যমে অনেক ধরণের উপযোগিতার সৃষ্টি হয়, যার কিছুটা পুষ্টির সাথে সম্পর্কিত। শিক্ষাগত বেশী যোগ্যতাসম্পন্ন ব্যক্তির আয়ও বেশী হয় এবং এই উচ্চতর আয়ের মাধ্যমে পরিবার উচ্চতর গুণগত মানের খাবার সংগ্রহের ক্ষমতা অর্জন করে। এখানে উল্লেখ করা দরকার যে স্বাক্ষরতা ও পান-সুপারী গ্রহণের মধ্যে প্রত্যক্ষ যোগাযোগ গবেষণায় উঠে এসেছে। নিরক্ষরদের তুলনায় শিক্ষিতদের মধ্যে পান-সুপারী গ্রহণের প্রবণতা শতকরা ৫০ ভাগ কম।

Many of the local families earn an income as construction workers on sites in the neighbourhood. This itinerant work makes it difficult to provide continuity in children's lives, especially for education.
ALEX BERLAND PHOTO

Introduction

IN THIS MONOGRAPH WE REPORT THE RESULTS OF A NUTRITION SURVEY conducted in early 2010 among families living in the shanty communities in the Abdullapur/Kamarpara area near the Tongi-Ashulia road. This is a neighbourhood in northern Dhaka, close to the Turag River. The survey was conducted among a sample of 120 married women, by nursing students at IUBAT—International University of Business Agriculture and Technology.

In assessing how to improve people's health – particularly in the case of a developing country – the simpler reforms deserve usually more attention than they receive. It is more important to organize good sanitary conditions than health clinics, more important to organize good health clinics than general hospitals, more important to organize good general hospitals than specialized tertiary care hospitals. This is not to ignore the value of the sophisticated reforms, but to emphasize that they should be built on solid foundations provided by getting the simple things right. Among the "simple things" to get right is nutrition.

There is a general consensus from diet surveys conducted in Bangladesh as to the nature of the country's nutritional problems. Here we summarize:

- Among the "ultra poor" the majority experience inadequate caloric intake. In her study, Haseen (2005) reported that over half her sample population had a BMI index below 18.5, the floor of the optimum BMI range. (See the glossary for explanation of nutritional concepts, including BMI.)
- Those in our survey are poor – but are not "ultra poor." Among such people, the majority have an adequate caloric

intake, as measured by the BMI. However, a large majority of calorie intake among this group, poor but not ultra poor, derives from cereals, primarily rice (Bose and Day 2007). An exacerbating problem is to prefer parboiled rice and discard the cooking water, thereby reducing the vitamins and minerals potentially derived from this cereal.

- Diets among the poor typically lack adequate quantities from the full range of food groups. This lack leads to inadequate intake of necessary micronutrients (minerals and vitamins), which in turn stunts growth and increases the risk of succumbing to numerous noncommunicable diseases. As example, inadequate servings of dairy products mean inadequate vitamin D, leading to higher risk of rickets among children and osteoporosis among adults (Pettifor 2004, Islam et al. 2008, UNICEF 2010).
- Basic dietary knowledge among many in Bangladesh, rich and poor, is weak. Among the poor this lack is particularly acute (Alam et al. 2010).

An appropriate caloric intake does not equate to good nutrition. If virtually all calories are derived from cereals and simple starches (rice and potatoes), an individual will lack protein (derived primarily from meat, fish, eggs and pulses) and also lack many vitamins and micronutrients found in a more varied diet. A diet containing excessive fats and sugars poses heightened risks of cardiac and diabetes problems. Good nutrition also requires access to safe drinking water. The definition of a community's nutrition can be extended further to include potentially harmful substances: rates of use of tobacco and betel nut, for example, should be low.

The World Health Organization (WHO) has been greatly concerned over the last decade about the deterioration in quality of diets around the world, among both rich and poor. Among the rich, in both the developed and developing world, the typical diet includes excessive calories, which has led to an unhealthy upward shift in the BMI distribution. To quote a WHO summary on trends:

> *In the last four decades the relative availability [in the typical diet] of staple foods (cereals, pulses and starchy roots) has decreased in almost all geographic regions. There are indications of partial shifts from staple foods towards vegetable oils and sugar in low and lower-middle income countries; towards vegetable oils, sugar and meat in upper-middle income countries, and towards vegetable oils and meat in higher income countries. The relative availability of fruit and vegetables has only increased slightly in most countries and is still well below the recommended level in both developed and developing countries. (WHO 2004, 10)*

Among residents of South Asia, the typical diet does not provide too many calories; a minority continue to suffer insufficient caloric intake. However, diets frequently include an excessive consumption of fats (much of it from cooking oils), of processed simple carbohydrates (such as white rice and potatoes) and insufficient consumption of milk products, fresh vegetables and fruits.

Many dishes taste better when prepared with generous quantities of oil, but a diet containing a great deal of oil and fat increases the probability of heart disease and other chronic problems.

In an attempt to improve nutrition, the WHO has launched high-profile campaigns, in particular campaigns to increase the share of calories derived from fruit and vegetables and to decrease, among the rich, the share derived from meat, oils and sugar. To quote a WHO appeal:

> *… low fruit and vegetable intake is estimated to cause about 31% of ischaemic heart disease and 11% of strokes worldwide. Overall it is estimated that up to 2.7 million lives could potentially be saved each year if fruit and vegetable consumption was sufficiently increased. Recommendations in this direction tend to complement and reinforce other valid messages based on the long known health benefits of consuming vegetables and fruit as dietary sources of fibre, vegetable proteins and protective micronutrients.* (WHO 2004, 7)

With a population of approximately 160 million, Bangladesh accounts for 2.5 percent of the world's population. Based on that percentage, good nutrition in Bangladesh might prevent each year 67,000 premature deaths.

This small section of the shanty area houses dozens of families living beside a busy highway behind the trees.

Methodology

A STANDARD MEANS TO SURVEY DIET QUALITY IS VIA DIET RECALLS, IN WHICH respondents are asked precisely what foods, and what quantities of these foods, they consumed in the previous 24 hours. The previous 24 hours may not always be representative of the individual's diet, but 24-hour recall studies are often the preferred survey technique for illiterate or semi-literate populations because a respondent's memory of food intake is likely to be more accurate than if the survey requires recall of food intake over a longer period.

The survey relating to nutritional status was conducted by nursing students working in pairs (one male and one female). To preempt problems with literacy, respondents were surveyed verbally from a structured questionnaire. Eligible respondents were the married female members of a household who were responsible for arranging meals (n = 120). In addition to questions related to nutritional and purchasing habits, each woman was provided with a 250 ml measure (approximately 1 cup) and asked to describe her own food intake for the previous day relative to the volume of the container. In order to help standardize the results, respondents were also asked whether their diet on that day was unusual (because, for example, it reflected a special occasion). Height and weight were measured at the time of the survey. Survey results were anonymous.

The WHO has developed a simple instrument to use in evaluating diet recall surveys. The instrument comprises 10 questions by which to score responses. A satisfactory answer to each question, from the perspective of good nutrition, is scored 1, an unsatisfactory answer 0. In our case, we allowed for an intermediate response, scored as 0.5. The distribution of our survey respondents on each of these 10 underlying questions is illustrated in figure 2. (For details on scoring see Appendix 1.)

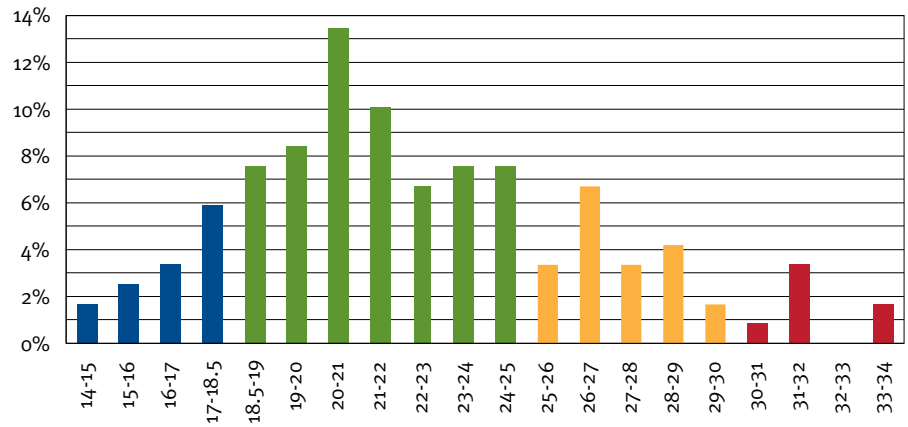
Stunting of normal growth, and skin and hair disorders are common signs of malnutrition. ALEX BERLAND PHOTO

Basic diet results

AS FIGURE 1 ILLUSTRATES, THE MAJORITY OF RESPONDENTS HAVE AN ADEQUATE caloric intake given their activity levels. For 12 percent of the sampled women however, BMI scores are below 18.5. For 67 percent, their BMI scores are within the optimum range of 18.5 – 25; for 21 percent, their BMI scores imply the respondents are overweight or obese.

Summing the score for each respondent on each question generates the distribution of food scores illustrated by figure 3. The range is from 0 to 10, with an average of 5.5.[1] The WHO categorizes very low-scoring diets as "risky", somewhat higher score

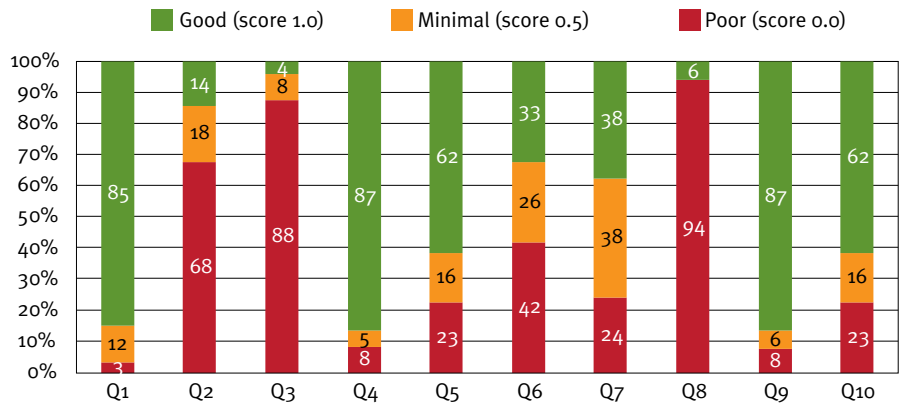
Figure 1: Distribution of Body Mass Index



diets as "fair", higher yet as "good", and finally "excellent". Based on the WHO criteria, the diets among 6 percent were ranked as "risky". A large majority, 89 percent, scored "fair". We subdivided this group into "fair – low", "fair – medium", and "fair – high". Among our sample, 5 percent scored "good"; no one scored "excellent".[2]

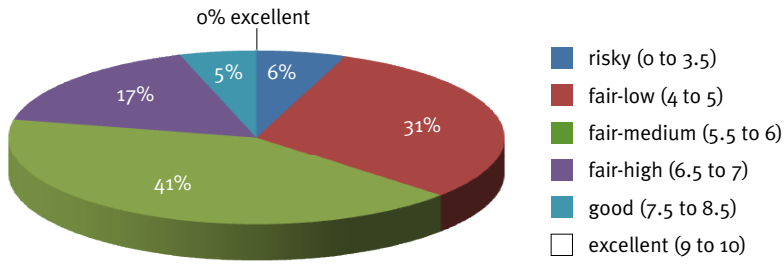
An understanding of the nutritional status of those in our sample requires examining scores on individual questions. Fully 85 percent consumed adequate servings from the cereals and potatoes group (Question 1). Similarly large percentages of respondents consumed adequate servings of meat or alternatives (Q4). Sixty-two percent consumed fats and sugars within acceptable limits, but the remainder consumed excessive servings from this group (Q5 and Q10).[3] The question on snacks (Q9) also targets fat consumption. Here the distribution of responses was reassuring: 87 percent were scored as consuming primarily healthy snacks.

Figure 2: Distribution of food scores, by question



Questions are listed in Appendix 1

Figure 3: Distribution of food scores

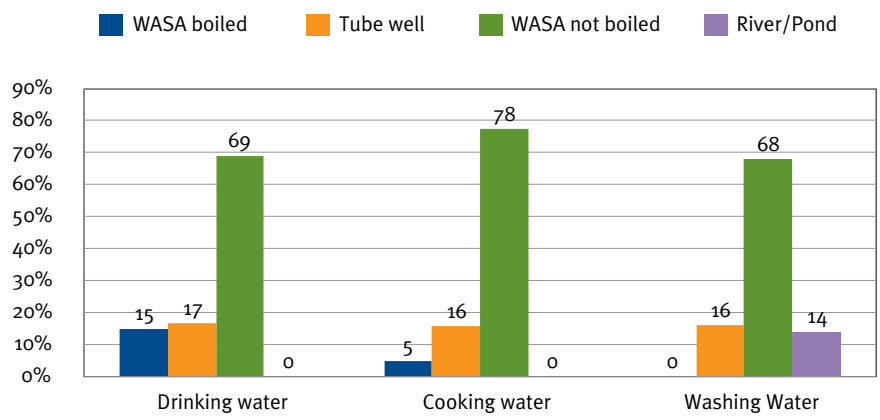


The remaining questions addressed diet inadequacies among respondents. Even with generous scoring, the proportion with adequate servings (score of 0.5 or 1) of milk products was only 12 percent (Q3). Only 32 percent had an adequate number of fruit and vegetable servings (Q2). Only 38 percent achieved a satisfactory score (score of 1) by consuming two fresh vegetables, albeit another 38 percent consumed one fresh vegetable (Q7). A very small share, 6 percent, consumed at least one fresh fruit (Q8). Finally, only 33 percent consumed a satisfactory variety from each of three food groups ([1] cereals and potoatoes, [2] fruits and vegetables, and [3] meat, fish, eggs, and daal) (Q6).

Figure 4 illustrates sources of water for drinking, cooking, and washing. The principal source is tap water provided by the Dhaka Water Supply and Sewerage Authority (WASA). Due to contamination from ground water, tap water may contain unacceptably high levels of pathogens. Water from tube wells should be free from water-borne pathogens in ground water, but it poses the long-term danger of arsenic poisoning in many places in Bangladesh. For drinking, 16 percent of families use boiled WASA water, 15 percent water from tube wells. The majority, 69 percent, rely on un-boiled WASA water, a non-sanitary option.

In addition to risky supply, contamination occurs during handling and transport of drinking water.

Figure 4: Distribution of drinking, cooking, and washing water, by source



Tobacco and betel nut

THE MOST COMMON WAYS TO CONSUME TOBACCO IN BANGLADESH ARE cigarettes, *bidis* (a cheap small-sized cigarette without filter), *hookah* (an instrument for smoking tobacco in which the smoke is cooled and filtered by passing through water) and chewing tobacco.

According to the World Health Organization (2010), in 2003 in Bangladesh 54.8 percent of men and 16.6 percent of women use tobacco. Again, according to the WHO, in 1997 1.6 percent of the population aged 10-14 were addicted to tobacco. The prevalence in this age group was 2.8 percent among males and 0.1 percent among females.

Tobacco use is the single most important cause of a large variety of cancers such as lung, larynx, oesophagus (food pipe), stomach, bladder, oral cavity and others. GLOBOCAN[4] (2008) reported that the average standardized rate[5] of mortality due to lung cancer is higher in Bangladesh (18.2 per 100,000 population) compared to all other South Asian countries. The comparable rates are India (5.9), Pakistan (7.1), Sri Lanka (6.6), Bhutan (9.2), Nepal (17.6) and Myanmar (16.6). It is often argued that the lack of tobacco control regulations is the major reason for the high rate of smoking prevalence in Bangladesh.[6]

In our study among 120 families, 69 percent of the households have at least one member who smokes. Figures 5 and 6 illustrate the distribution of households by the number of members who smoke, and the dramatic differences between rates for husbands and wives. The prevalence of smoking is much higher among husbands of the families surveyed than the wives.

Among families with at least one smoker, the average consumption is 8.6 bidis per day. The estimated average monthly expen-

Figure 5: Distribution of families by number of persons smoking tobacco

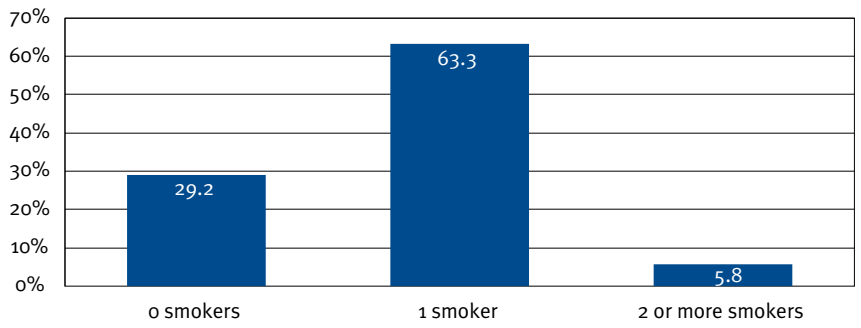


Figure 6: Distribution of spouses by smoking tobacco and chewing betel nut

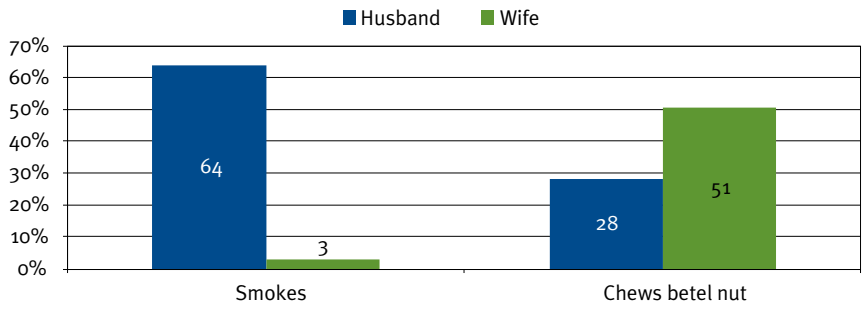


Figure 7: Distribution of estimated monthly expenditure on tobacco, by households with smokers

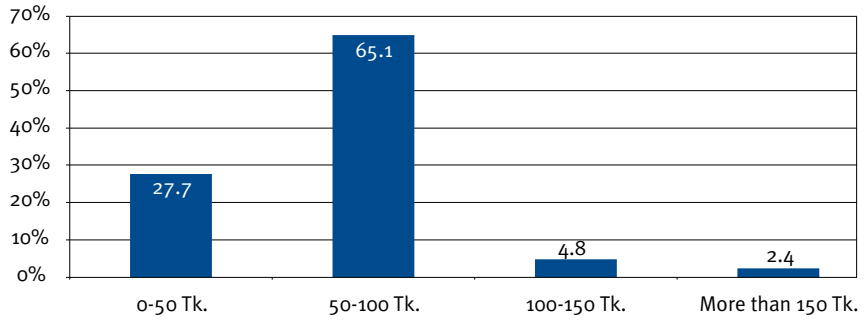
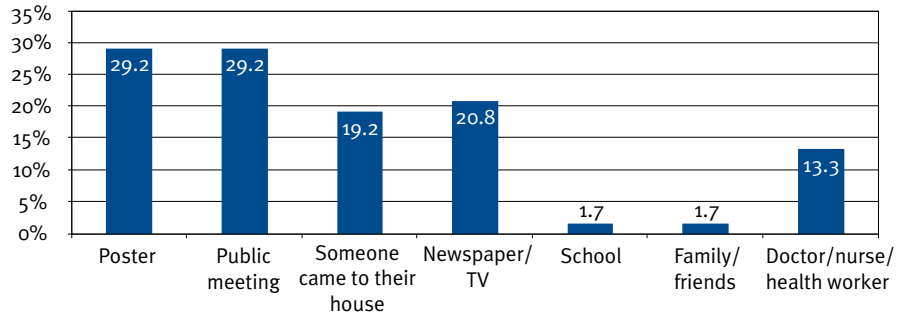


Figure 8: Sources of information about health dangers of smoking



Note: Cumulative percentages exceed 100 because some respondents received information from more than one source.

diture on tobacco among these families is 63 Taka with the corresponding expenditure distribution illustrated in figure 7. (See Appendix 3 for assumptions underlying estimates.)

About 76 percent of the total households reported having received some information about smoking threats to health, from a variety of sources: posters, public meetings, community/NGO workers, family/friends, television/newspaper, school, and health workers. (See figure 8.)

Only seven families reported that a family member stopped smoking in the last year; 36 households claim to smoke less than before. Among the reasons cited for reducing or stopping, the most frequently mentioned among these 43 households is consciousness of health dangers. Whereas only seven mentioned high price, 26 mentioned health worries. Among the other reasons mentioned to stop/reduce smoking was family pressure from the wife in the case of husbands.[7] Four households reported that one or more family members started smoking in the last year.

Betel nut, popularly known as *paan-supari* in most parts of South Asia, is the combination of betel leaves and areca nuts. Often a pinch of shell-lime paste (*chun*), tobacco leaves and some other spices are added to make the betel quid more tasteful. Bangladesh and other South Asian countries have thousands of years of tradition of chewing *paan*. In rural areas, offering *paan* to guests and relatives is a symbol of hospitality. People chew *paan* as a recreational drug, as well as a breath freshener and for digestive purposes. *Paan* is also offered at urban functions with high-income attendees.

There are serious harmful effects associated with the habit. The areca nut is itself associated with oral cancer. The International Agency for Research on Cancer, part of the WHO, has determined that betel nut chewers have a 28 times higher likelihood of oral cancers than non-chewers (WHO

2003). Betel quid with tobacco is linked with oral cancer, cancer of the pharynx, and of the oesophagus. Of the 390,000 oral and oro-pharyngeal cancers estimated to occur annually in the world, 58 percent occur in South and South-East Asia (WHO 2003). Though there are a number of awareness-building programs in Bangladesh run by government and NGOs on the health effects of tobacco and smoking, no program has specifically focused yet on the harmful health effect of betel quid.

In our study, in 65 percent of the families surveyed at least one member chews *paan*. (See figure 9.) There are dramatic gender differences in distribution of betel nut chewing compared to smoking. While the prevalence of smoking is much higher among husbands

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than wives, recall that the rate of betel nut chewing is higher among wives. (See figure 6 on page 28.)

We conducted for betel nut an expenditure estimate analogous to that for tobacco. (Refer to Appendix 3 for assumptions underlying the estimated cost per serving.) On average, families with at least one betel nut chewer take 6.4 servings per day. The estimated average monthly expenditure of these families on betel nut is 144 Taka. Figure 10 shows the distribution of households, with at least one person who chews, by estimated monthly betel nut expenditure.

Among the 120 households surveyed, 17 reported that someone in their family started chewing betel nut in the last year. In one household the wife reported she stopped chewing; 30 households reported purchasing less betel nut than before. The major reason cited for chewing less betel nut is the concern about health. Twelve of these 30 referred to health worries, seven to high price.

Figure 9: Distribution of families by number of persons chewing betel nut

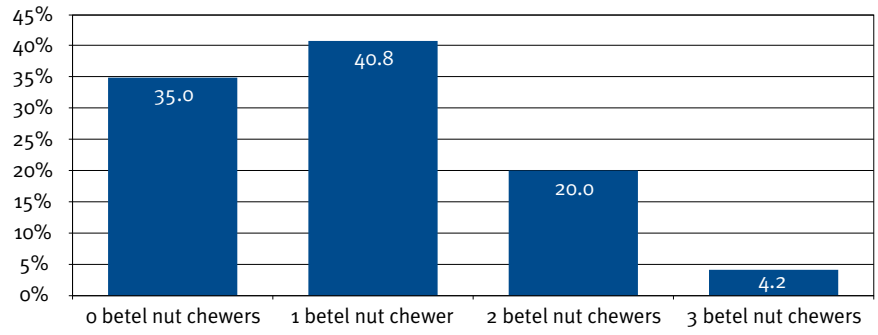
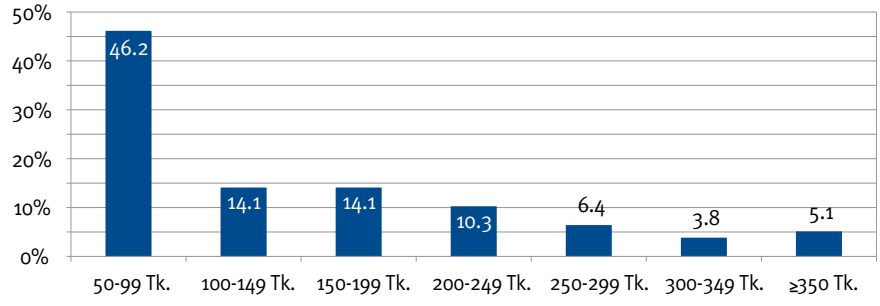


Figure 10: Distribution of estimated monthly betel nut expenditure, by households with members chewing betel nut



Widely available snack foods provide "empty calories" for people with limited cooking facilities. ALEX BERLAND PHOTO

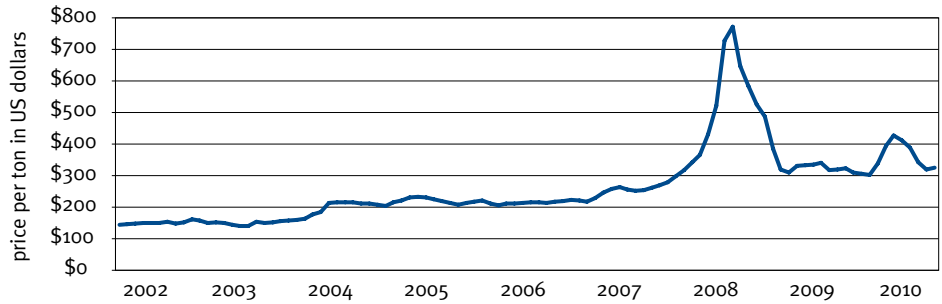
Food price inflation

BETWEEN 2007 AND 2009 A DRAMATIC SPIKE IN INTERNATIONAL RICE PRICES occurred (See figure 11.) At its peak, in mid-2008, the price of internationally traded rice was over three times its average in 2006. Local rice prices in Dhaka did not rise as dramatically, but at their peak, in mid-2008, they were nearly twice prices prevailing in mid-2005.

In general, there has been high volatility of food prices over the period considered, from 2005 to 2009. And, as measured, the rise in all basic food prices exceeded the increase in the general consumer price index for the four-year interval. We include here figures 12 through 16 and table 1, documenting the extent of variation in basic food prices in Dhaka over these years.

Our dietary survey provides fragmentary evidence on the impact of price changes on diets over recent years: 31 percent reported

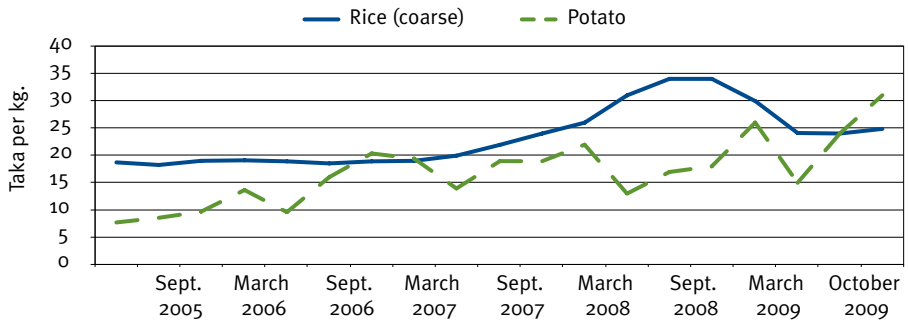
Figure 11: International price of Thai white broken rice (A1 Super)



Source: Food and Agricultural Organization (2010)

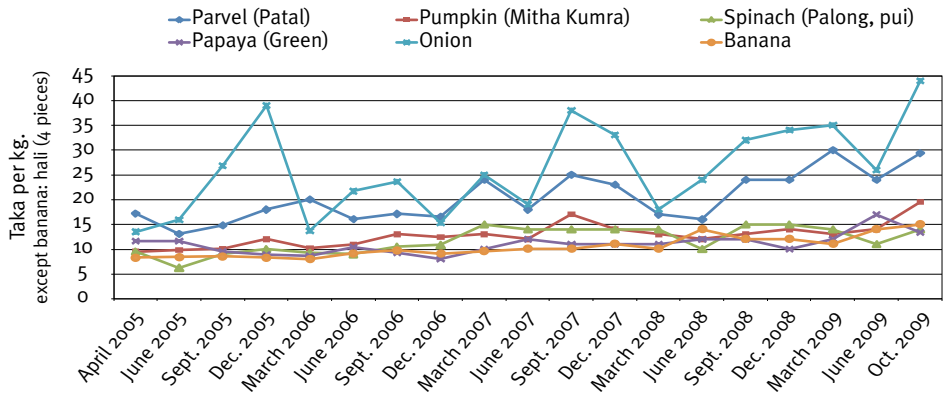
having ceased buying one or more foods because of high price over the preceding year. It seems reasonable to conclude that the effect on nutrition from these price increases and volatility was probably negative. In terms of share of a typical family's food expenditures, rice is the most important commodity. Higher rice prices may have induced people with low incomes to sacrifice dietary variety in order to maintain rice consumption. Furthermore, dramatic increases in the price of a particular food may have deterred families from buying it, but in the absence of basic dietary knowledge, the family may not have introduced an appropriate substitute food.

Figure 12: Price of carbohydrate sources in Dhaka, April 2005 to October 2009



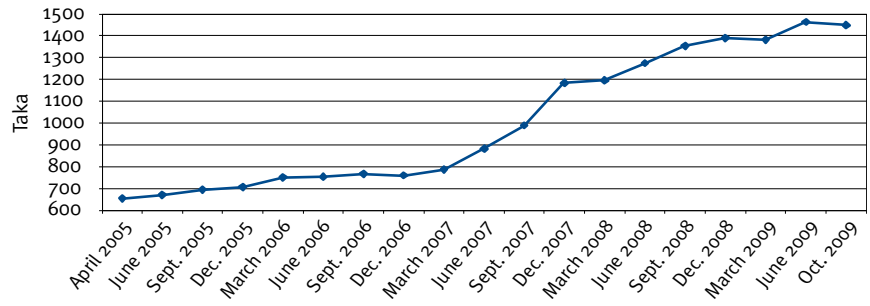
Source: Bangladesh Bureau of Statistics (2009)

Figure 13: Price of vegetables and fruits in Dhaka, April 2005 to October 2009



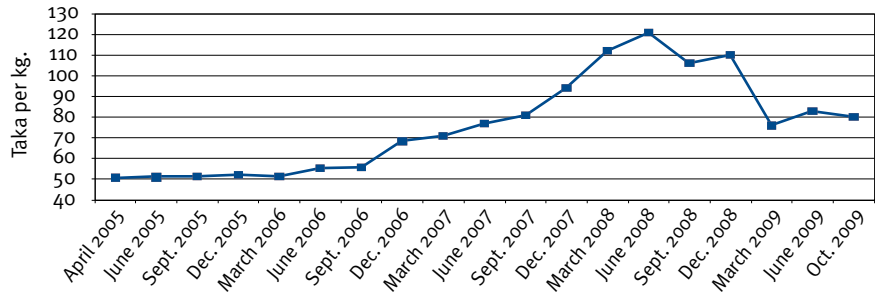
Source: Bangladesh Bureau of Statistics (2009)

Figure 14: Price of powdered milk (Dano 2 kg. tin) in Dhaka, April 2005 to October 2009



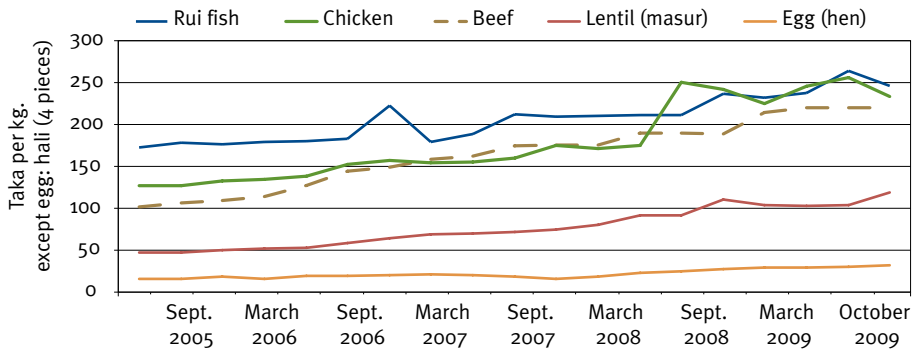
Source: Bangladesh Bureau of Statistics (2009)

Figure 15: Price of soybean oil in Dhaka, April 2005 to October 2009



Source: Bangladesh Bureau of Statistics (2009)

Figure 16: Price of protein sources in Dhaka, April 2005 to October 2009



Source: Bangladesh Bureau of Statistics (2009)

Table 1: Price variation of basic foods in Dhaka, 2005 to 2009			
Commodity (unit)	Price change	Minimum	Maximum
	per cent	taka	
Potato (kg.)	141.8	7.7	31.0
Lentil, Masur (kg.)	118.1	47.3	118.9
Powdered milk (Dano 2 kg. tin)	108.4	655.0	1464.0
Beef (kg.)	101.5	101.7	220.0
Chicken, deshi (kg.)	83.2	127.0	256.0
Eggs, hen (hali)	80.6	15.8	32.0
Parvel/Patal (kg.)	70.1	13.1	30.0
Soybean oil (kg.)	69.8	50.8	121.0
Banana (hali)	56.6	8.0	15.0
Spinach/Palong/pui (kg.)	55.5	6.2	15.0
Pumpkin/mitha kumra (kg.)	46.6	9.5	19.6
Onion (kg.)	46.0	13.5	44.0
Rui fish (kg.)	38.9	172.6	264.0
Rice, coarse (kg.)	37.0	18.2	34.0
Papaya, green (kg.)	26.0	8.1	17.0
Change in consumer price index (from average of July 2005 – June 2006 to average of January – October 2009)	25.6		

Notes: The price change is calculated as the percent change from the average of July 2005 – June 2006 to the average of January – October 2009. A "hali" refers to four units.
Source: Bangladesh Bureau of Statistics (2009), Bangladesh Bank (2010).

One of the agricultural success stories in Bangladesh has been the increase in supply of poultry.

What factors influence nutritional status?

THE SURVEY AFFORDS SOME EVIDENCE ABOUT WHAT FACTORS BEAR ON the differences in nutritional decisions made by survey respondents. Two sets of factors are of particular importance:

- *Literacy*: Unfortunately, education levels among the surveyed women are low. The highest education level reached by the median respondent is a grade in the primary cycle (grades 1 – 5). The most relevant measure of education achievement is probably the ability to read. Among respondents, 42.5 percent reported not being able to read; 20 percent reported reading "a little", and 37.5 percent said they could read.
- *Nutritional advice*: We asked respondents whether they had received nutritional advice and, if so, from whom. We categorized sources of advice as family, health workers, and community/social leaders.

In turn, we statistically examined whether these factors have an impact on three nutritional decisions:

- the probability that the family uses boiled or tube well drinking water;
- the probability that the respondent chews betel nuts; and
- decisions affecting the respondent's food score.

In Appendix 2 we report the results of three simple regressions that attempt to explain these nutritional choices. The regressions are suggestive; they do not attempt to specify all potentially relevant variables.

The most convincing result arises in explaining the probability that the respondent

chews *paan*. Here, literacy has a highly significant impact. (See figure 17). Women who can read are less than half as likely to chew as those who cannot. There is no evidence that a woman's husband chewing *paan* induces her to do likewise. The coefficient sign is negative, implying the respondent *less* likely to chew if he does, but this is a statistically insignificant variable. Likewise receiving nutritional advice from any of the three sources generates a negative coefficient, implying perhaps some impact on lowering the probability of chewing, but again all three coefficients are insignificant.

In explaining the probability that the respondent uses safe drinking water, the only statistically significant explanatory factor is receiving advice from a health worker. (See figure 18.) Respondents being able to read and receiving advice from a social or community leader are associated with statistically insignificant positive impacts. Receiving advice from family members is associated with a statistically insignificant negative impact.

In the matter of the respondent's food score the one statistically significant impact is again via advice from a health worker. Those respondents receiving such advice had, on average, a score that was 0.4 point higher than those who did not. The impact of literacy and advice from family members and social or community leaders may well be important in particular cases but overall is statistically insignificant.

Figure 17: Impact of literacy on nutrition

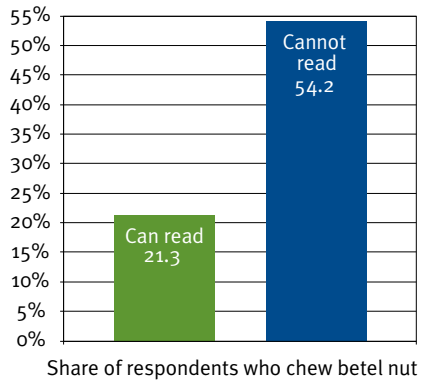
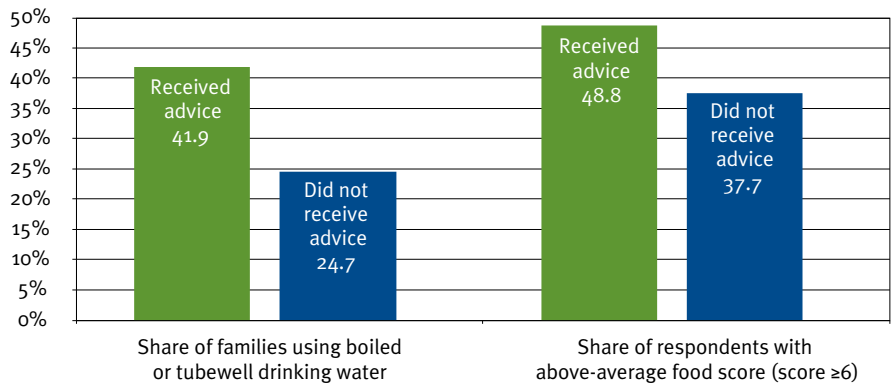


Figure 18: Impact of healthworker advice on nutrition



Conclusion

THIS STUDY IS A BENCHMARK OF THE NUTRITIONAL STATUS IN A TYPICAL DHAKA shanty community at one point of time, in early 2010. We hope to undertake subsequent yearly surveys. It is only by tracking changes in nutritional status over time that it becomes possible to draw solid conclusions about whether the community's nutritional status is improving.

While this "point in time" study does not permit discussion of trends, there are conclusions worth making.

The role of advice from health workers

Among all sources of advice on diet and use of sanitary drinking water, the one source of advice to have a statistically significant influence among those surveyed was that from health workers visiting the respondents' homes. Advice from other sources (such as family members, posters, meetings and media campaigns) may matter but overall we could not detect a statistically significant impact. These results suggest that allocating trained health workers to undertake one-on-one counseling is probably a good use of personnel time, both by government health authorities and concerned NGOs.

Obtaining a healthy diet at minimum cost

There has been high inflation and volatility of food prices over the last five years. Local health agencies could undertake the exercise of costing alternate nutritional diets on a regular basis and, using current prices, offer advice to families on how best to maintain – and improve – dietary quality at minimum cost.

The benefits of education

Achieving higher education levels has major benefits, only some of which relate to nutrition. Adults with higher education levels have higher average incomes; one consequence of higher incomes is the ability of families to afford a superior quality of diet. It is also worth emphasizing the direct link we found between literacy and chewing *paan*. The proportion who chew among those who can read is less than half that among those who cannot.

Education takes many forms. Children may learn from a teacher. They may also, like this young girl, learn a trade from a family member.

Scoring the diet survey

We used a modified version of the ten-question food scoring instrument proposed by the WHO (2001). Below are the WHO questions and detailed notes on our scoring procedure.

Legend

- s: serving
- cup: one cup is 250 ml (approx.)
- tsp: teaspoon

Q1: Did the individual eat at least 6 servings from the cereals and potato group?

- s ≥ 6 from cereals and potato group: 1 point
- 3 ≤ s < 6 from cereals and potato group: 0.5 point
- s < 3 from cereals and potato group: 0 point

where

- ½ cup cooked rice = 1 serving
- ½ cup potato (cooked/ fried) = 1 serving (not considered in vegetables group)
- 1 roti/bread = 1 serving
- 1 pitha = ½ serving

Q2: Did the individual eat at least 5 servings from vegetables and fruits group?

- s ≥ 5 from vegetables and fruits group: 1 point
- 2.5 ≤ s < 5 from vegetables and fruits group: 0.5 point
- s < 2.5 from vegetables and fruits group: 0 point

where

- ½ cup vegetables = 1 serving
- 1 banana or 1 apple or 1 orange or 1 mango = 1 serving
- ½ cup grapes = 1 serving

Q3: Did the individual have at last 2 servings from the milk products group?

- s ≥ 2 from milk products: 1 point
- 1 ≤ s < 2 from milk products: 0.5 point
- s < 1 from milk and milk products: 0 point

where

- 1 cup milk = 1 serving

- 4 small cups tea (with milk) = 1 serving of milk
- We considered 1 large cup of tea (250 ml, used in the survey) equivalent to 4 small cups of tea. Lower income people in Bangladesh usually use small cups. We assumed each cup of tea contains some milk and the milk in 4 cups of tea equals one milk serving.

Q4: Did the individual eat at least 1 serving from meat and alternatives group (meat, fish, eggs, daal or other pulses)?

- $s \geq 1$ from meat and meat alternatives group: 1 point
- $0.5 \leq s < 1$ from meat and meat alternatives group: 0.5 point
- $s < 0.5$ from meat and meat alternatives group: 0 point

where

- ½ cup of meat (any kind) = 1 serving
- ½ cup fish (any kind) = 1 serving
- 1 egg = 1 serving
- ½ cup daal or other pulses = 1 serving

Q5: Did the individual consume fewer than 2 servings from the fat, oils and sugar group?

- $0 \leq s \leq 2$ from fats, oils and sugar group: 1 point
- $2 < s < 4$ from fats, oils and sugar group: 0.5 point
- $s \geq 4$ from fats, oils and sugar group: 0 point

where

- 2 tsp of oil = 1 serving
- 2 tsp butter = 1 serving
- 2 tsp sugar = 1 serving

For this question we made the following detailed scoring assumptions:

- 1 biscuit = ½ serving from fat, oil, sugar group
- 1 packet chips = 1 serving from fat, oil, sugar group
- 1 large cup of tea or 4 small cups of tea = 2 servings of sugar (assuming 1 tsp sugar per small cup)
- 1 cup halka/faltu food = 1 serving of fat, oil, sugar group
- 1 pitha = ¼ serving from fat, oil, sugar group (lower income people generally prepare pitha with or without oil, but sugar/gur is a common ingredient. As types of pitha were not specified in the survey, we assumed each pita contributed a small portion of a fat, oil, sugar group serving)
- 1 puri/ samosa/ singara = ¼ serving of fat, oil, sugar group

We also assessed the impact of meat, fish, vegetables, eggs and daal consumption on the fat, oil, sugar group. In Bangladesh, most people use oil (as much as they can!) when they prepare curries. Also meat and fish contain fat:

- 1 cup of meat = ½ serving of fat, oil, sugar group
- 1 cup of fish = ½ serving of fat, oil, sugar group
- 1 cup of vegetable = ½ serving of fat, oil, sugar group
- 1 cup of daal = ¼ serving of fat, oil, sugar group (usually less oil use to cook daal than curry)
- 1 egg = ½ serving of fat, oil, sugar group (fried is the most common means to consume eggs for lower income people) where 1 cup egg = 2 eggs

Q6: Did the individual eat a variety of foods within each of three main food groups ([1] cereals and potato, [2] fruits and vegetables, [3] meat, fish, eggs, daal)?

- 2 items in each of 3 food groups: 1 point
- 2 items in each of 2 food groups: 0.5 point
- 2 items in 0 or 1 food group: 0 point

Very few low-income Bangladeshi consume a variety of milk products. To include this group, as recommended by the WHO, would have generated unreasonably low scores on this question.

Q7: Did the individual eat at least 2 fresh vegetables?

- 2 or more fresh vegetables: 1 point
- 1 fresh vegetable: 0.5 point
- 0 fresh vegetables: 0 point

Here we considered leafy and other vegetables in terms of number of items, as opposed to quantity of servings.

Q8: Did the individual eat at least one fresh fruit?

- 1 or more fresh fruit: 1 point
- 0 fresh fruits: 0 point

As for Q7, we considered number of items, not quantity of servings. We awarded no intermediate 0.5 scores to this question.

Q9: Did the individual eat mostly nutritious snacks?

- 0 snacks or 1 fruit: 1 point
- 0 or 1 processed snacks (shingara, samosa, puri, packet of chips) plus 1 or more fruit: 1 point
- 1 or 2 processed snacks plus 1 or more fruit: 0.5 point
- > 2 processed snacks plus 1 or more fruit: 0 point
- 0 or 1 biscuit and 1 or more fruit: 1 point
- 1 or 2 biscuits plus 1 or more fruit: 0.5 point
- > 2 biscuits and 1 or more fruit: 0 point
- 0 – 2 pithas and 1 or more fruit: 1 point
- 2 – 3 pithas and 1 or more fruit: 0.5 point
- > 3 pithas and 1 or more fruit: 0 point

As snacks we considered the halka/faltu foods. Respondents reported consuming biscuits, chips, shingara, samosa, puri, pitha, puffed/beaten rice (khoi/chira) as snacks. We gave more points if the foods contain hygienic/nutritious items and were probably produced in hygienic situations. Shingara, samosa, puri, and chips are widely available in Bangladesh; however they are often cooked in unhygienic situations by street vendors, and most contain lots of oil. Pithas (sweet breads or pastries) are mostly home-cooked in more hygienic situations and contain less oil. We considered fruits as potential snacks.

Q10: Did the individual consume mostly lean or low fat content foods?

This question was scored identically to Q5.

APPENDIX 2

Regressions on nutrition

Regressand	Probability of respondent's family using boiled or tube well drinking water (1)	Probability of respondent chewing betel nut (2)	Respondent's food score (3)
Constant	-7.89**	4.71	5.44**
Literacy (1: respondent can read; 0: reads a little or does not read)	3.40	-10.28**	-0.28
Husband and betel nut (1: respondent's husband chews; 0: does not)		-3.98	
Advice from family members (1: respondent received advice from family members; 0: otherwise)	-1.79	-5.59	-0.14
Advice from health workers (1: respondent received advice from health workers; 0: otherwise)	4.47*	-1.44	0.40*
Advice from social-community leaders (1: respondent received advice from social or community leaders; 0: otherwise)	1.73	-0.36	0.60
R^2	0.05	0.14	0.06
R^2 adjusted	0.02	0.04	0.03

Legend: *0.05 significance (one-tail). **0.025 significance (one-tail)

Note: Number of observations is 120. All regressions are ordinary least squares (OLS). The regressands for regressions (1) and (2) are log of the odds of the relevant probabilities and the functional form estimated is a logistic curve. The functional form for regression (3) is linear; the regressand is the actual food score.

APPENDIX 3

Estimation of unit cost of bidi and betel quid

We assumed that families in the sample smoke *bidi* rather than the more expensive cigarette. In Dhaka, the current price of one packet of *bidi* (containing 25 pieces) is very low, 6 Taka, implying a price per *bidi* of 0.24 Taka.

Betel quids are widely available at street shops in Dhaka, at an estimated cost of 1 – 2 Taka per quid. But people who regularly chew betel quid three or four times per day generally buy betel leaves, areca nut (*supari*) and *chun* separately, and prepare the quid themselves. The price of one packet (80 pieces) of betel leaf we estimate at 125 Taka, and the price of 100 pieces of areca nut 180 Taka. We assumed for each betel quid one third of a betel leaf and one eighth of an areca nut. Thus, the estimated cost per serving of betel quid is 0.75 Taka.

MARKLS PHOTO/FLICKR

Notes

1 The median is equal to the average: both are 5.5. The standard deviation of the 120 scores is 1.1.

2 Nicholls' (2009) food score distribution in the initial survey differed somewhat from the results of this second survey. Mean score for her sample of 105 women was 5.3, median 5.0, and standard deviation 1.1. Based on the food score intervals utilized here, the distribution across the six categories for her sample was as follows: risky (5 percent), fair – low (57 percent), fair – medium (27 percent), fair – high (5 percent), good (5 percent), excellent (2 percent). The share classified as either risky, fair, or good/excellent are similar to ours but within the fair category, her sample is more heavily weighted toward the lower subcategories. The explanation for the difference is some combination of choice of sample and differences in coding procedure. Diet recall surveys are approximate instruments, and variations are to be expected.

3 We scored Q5 and Q10 identically. The effect is to give a double weighting to the low-fat criterion in determining diet quality.

4 GLOBOCAN is an international agency for research on cancer, a WHO project.

5 See glossary for definition of age standardized rate

6 The Government of Bangladesh, in collaboration with the WHO (WHO Bangladesh 2010), has prepared the National Policy and Plan of Action for Tobacco Control. The plan is intended to decrease per capita tobacco consumption per year by increasing public awareness; prohibition of all forms of advertisement, promotion and sponsorship; setting appropriate price and tax for tobacco, and implementation of tobacco control law.

7 It should be noted that reasons are not mutually exclusive: three households mentioned multiple reasons to stop/reduce smoking.

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Glossary

AGE-STANDARDIZED RATE (ASR): A rate is the number of new cases or deaths per 100 000 persons per year. An age-standardized rate is the rate that a population would have if it had a standard age structure. Standardization is necessary when comparing several populations that differ with respect to age because age has a powerful influence on the risk of cancer (GLOBOCAN 2008).

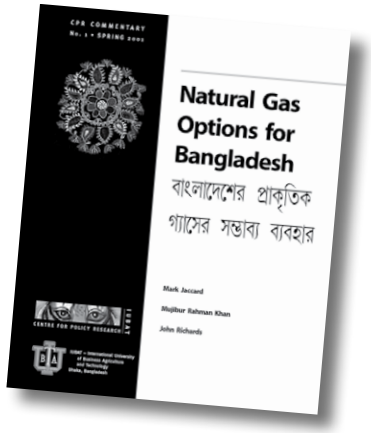
BODY MASS INDEX (BMI): The index for an individual is equal to his or her weight, in kilograms, divided by the square of his or her height, in meters (= kg/m^2). The BMI is a widely used measure of adequacy of caloric intake, of whether an individual is consuming too little, enough, or too much food to provide the energy required for daily activities. The optimum BMI range is considered to be 18.5 – 25 (WHO 2001). Both those with BMI indices below 18.5 and those above 25 are incurring higher risks of various non-communicable diseases and syndromes than those within the optimum range. Those whose BMI is below 18.5 are underweight; those with BMI of 25 – 30 are overweight. Those with BMI above 30 are obese, and should definitely be consuming fewer calories.

SHANTY COMMUNITIES: We use the term to describe informal settlements, some temporary and some long established, of poor families living in low-cost housing units usually built and maintained by the occupants. The settlements may be on either publicly or privately owned land. The inhabitants pay rent, typically to someone who is not the landowner. The communities surveyed are located in an area of rapid urban development, and many of the family members are employed in construction of multi-storey apartment buildings.

CPR COMMENTARY NO. 1

Natural Gas Options

বাংলাদেশের প্রাকৃতিক গ্যাসের সম্ভাব্য ব্যবহার



by **MARK JACCARD**, *Director, Energy Research Group, School of Resource and Environmental Management at Simon Fraser University,* **MUJIBUR RAHMAN KHAN**, *Professor, College of Engineering and Technology at IUBAT, and* **JOHN RICHARDS,** *Professor, Master of Public Policy Program at Simon Fraser University*

The very low level of available commercial energy is a serious constraint on economic development in Bangladesh. Fortunately, there is one bright prospect – sizeable discoveries of natural gas.

This report explores three options for how Bangladesh might use its natural gas endowment: exporting gas to provide public revenues that could be directed to many other development needs; expanding the many possible end-uses for gas in domestic industry, agriculture and households; or concentrating natural gas use on accelerated electrification. After assessing the three options, the authors conclude that rapid electrification should have the highest priority.

In addition, the report discusses institutional reforms to foster private investment and to improve the transparency, efficiency and consistency of government corporations, ministries and agencies. There is an important case to be made for integrated resource planning that includes environmental and social objectives.

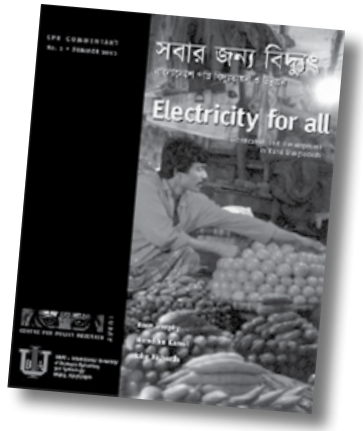
বাণিজ্যিক খাতে জ্বালানি শক্তির অতিস্বল্পতা বাংলাদেশের অর্থনৈতিক উন্নয়নের পথে একটি গুরুত্বপূর্ণ অন্তরায়। সৌভাগ্যক্রমে প্রাকৃতিক গ্যাসের বড় ধরনের উৎস আবিস্কৃত হওয়ায় উন্নয়ন ক্ষেত্রে একটি উজ্জ্বল সম্ভাবনা সৃষ্টি হয়েছে। এই প্রতিবেদনে বাংলাদেশের প্রাকৃতিক গ্যাস সম্পদ ব্যবহারের তিনটি সম্ভাবনা নিয়ে পর্যালোচনা করা হয়েছে ঃ গ্যাস বিদেশে রপ্তানী করে সরকারী রাজস্বখাতে অর্থ আয় যা উন্নয়নের চাহিদা মিটাতে পারবে, দেশীয় শিল্প, কৃষি, গৃহস্থলি ও অন্যান্য সম্ভাব্য কাজে গ্যাসের ব্যবহার সম্প্রসারণ; বা দ্রুত বিদ্যুতায়নের ক্ষেত্রে প্রাকৃতিক গ্যাসের ব্যবহার কেন্দ্রীভূত করা। এই তিনটি সম্ভাবনা যাচাই করে প্রতিবেদকগণ এই সিদ্ধান্তে পৌছেন যে দ্রুত বিদ্যুতায়নই সর্বোচ্চ প্রাধান্য পাওয়া উচিৎ।

অধিকন্তু এই প্রতিবেদনে কিছু কিছু প্রাতিষ্ঠানিক সংস্কারের বিষয় আলোচনা করা হয়েছে যা বেসরকারী বিনিয়োগকে উৎসাহিত করবে এবং সরকারী প্রতিষ্ঠান, মন্ত্রণালয়সমূহ এবং এজেন্সিসমূহের কাজের স্বচ্ছতা, দক্ষতা এবং নির্ভরযোগ্যতা বৃদ্ধি করবে। পরিবেশগত এবং সামাজিক লক্ষ্যগুলি অন্তর্ভূক্ত করে সমন্বিত সম্পদ পরিকল্পানার গুরুত্বের বিষয়ও এই প্রতিবেদনে সুপারিশ করা হয়েছে।

CPR COMMENTARY NO. 2

Electricity for All

সবার জন্য বিদ্যুৎ



by **ROSE MURPHY,** *Research Associate with the Energy and Materials Research Group at the School of Resource and Environmental Management at Simon Fraser University,* **NURUDDIN KAMAL**, *Senior Research Fellow for the Centre for Policy Research at IUBAT, and* **JOHN RICHARDS,** *Professor, Master of Public Policy Program at Simon Fraser University*

বাংলাদেশে পাঁচজনের মধ্যে মাত্র একজন বিদ্যুতের সুবিধা পান। গ্রাম বাংলায় বিদ্যুতের সুবিধা পান প্রতি সাতজনে একজন।

বাংলাদেশে বিদ্যুৎ খাতে এই সমস্যাগুলি কেন অব্যাহত থাকছে? এই সমস্যাগুলি সমাধানের জন্য কি ব্যবস্থা নেয়া যায়? এই রিপোর্টে দ্রুত বিদ্যুতায়ন, বিশেষ করে পল্লি বিদ্যুতায়নের ক্ষেত্রে বাধা সমূহের মূল্যায়ন করা হয়েছে। একই সাথে এই বাধাসমূহ দূর করার জন্য কিছু বাস্তবধর্মী সুপারিশ রাখা হয়েছে।

বর্তমানে পল্লি বিদ্যুতায়ন বোর্ড (আর ই বি) এবং তার সমবায় নেটওয়ার্ক পল্লি বিদ্যুৎ সমিতিগুলির মাধ্যমে পল্লি এলাকায় দেশে ব্যবহৃত বিদ্যুতের এক চতুর্থাংশ বিতরণ করে। এই আকর্ষণীয় সাফল্য সত্ত্বেও, বাংলাদেশে বিদ্যুতায়নের ক্ষেত্রে আরো অনেক কিছু করার বাকি আছে।

গবেষকগণ সুপারিশ করেন যে আর ই বি'কে স্বাধীনভাবে বিদ্যুৎ উৎপাদনের প্রতি অগ্রাধিকার ভিত্তিতে অধিক গুরুত্ব দিতে হবে, বিশেষ করে জাতীয় সঞ্চালন গ্রীড বহির্ভূত এলাকাসমূহে। এই সম্প্রসারণের জন্য প্রয়োজন হবে অধিকতর মাত্রায় ব্যক্তিখাতে বিনিয়োগে এবং আর ই বি গ্রাহকদের ক্ষেত্রে বর্ধিত হারে গড় ট্যারিফ।

অধিকতর হারে নতুন বিনিয়োগ আকর্ষণ এবং ট্যারিফসমূহের সংস্কার কঠিন কাজ, তবে বিদ্যুৎ ব্যবস্থার ব্যাপক সম্প্রসারণের লক্ষ্যে গুরুত্বের সাথে এই প্রয়োজনীয় সংস্কারসমূহ বাস্তবায়ন যুক্তিসঙ্গত।

Only one in five Bangladeshis has access to power; among those in rural areas the ratio is about one in seven. What can be done to improve access? This report assesses the barriers to accelerated electrification – rural electrification in particular – and offers practical recommendations.

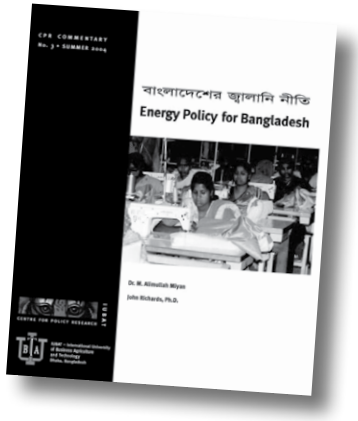
The Rural Electrification Board (REB) and its network of cooperatives – Palli Biddyut Samitees – now distribute nearly a quarter of electricity consumed in the country. Despite this impressive accomplishment, they need to do more.

The authors recommend that the REB place a high priority on power generation independent of the national transmission grid. This expansion will require private investment and higher average tariffs for REB customers. Securing major new investment and revising tariffs will not be easy, but the goal of increased electrification is sufficiently important to justify the required reforms.

CPR COMMENTARY NO. 3

Energy Policy for Bangladesh

বাংলাদেশের জ্বালানি নীতি



by **DR. M. ALIMULLAH MIYAN,** *Vice Chancellor and Founder, IUBAT, and* **JOHN RICHARDS,** *Professor, Master of Public Policy Program at Simon Fraser University*

বাংলাদেশের ভবিষ্যৎ সমৃদ্ধির জন্য পর্যাপ্ত পরিমাণ বাণিজ্যিক জ্বালানি সরবরাহের গুরুত্ব সম্বন্ধে অতিরঞ্জনের কোন অবকাশ নেই। বাংলাদেশ সরকার ২০০৪ সালের মে মাসে একটি খসড়া জাতীয় জ্বালানি নীতি ঘোষণা করে এবং এর উপর জনসাধারণের অভিমত আহবান করে। সরকারের এই প্রতিবেদনে বর্তমান নীতির গুরুতর সমস্যার বিষয় এবং নূতন নীতি প্রণয়ন যে অতীব বিতর্কপূর্ণ তা স্বীকার করা হয়।

সেন্টার ফর পলিসি রিচার্সের এই তৃতীয় প্রতিবেদনটির মাধ্যমে খসড়া জাতীয় জ্বালানি নীতির উপর মন্তব্য এবং সুপারিশ করা হয়েছে। ড. এম আলিমউল্যা মিয়ান, উপাচার্য ও প্রতিষ্ঠাতা, আই ইউ বি এ টি - ইন্টারন্যাশনাল ইউনিভার্সিটি অব বিজনেস এগ্রিকালচর এন্ড টেকনোলজি এবং ড. জন রিচার্ডস, অধ্যাপক, সাইমন ফ্রেজার ইউনিভার্সিটি, কানাডা এবং আই ইউ বি এ টি'র ভিজিটিং অধ্যাপক এই প্রতিবেদনটি প্রণয়ন করেছেন। তাঁদের সুপারিশ মালার মধ্যে প্রাকৃতিক গ্যাসের রপ্তানি থেকে শুরু করে জৈব জ্বালানি শক্তি ব্যবহারের উন্নতি সাধনসহ গুরুত্বপূর্ণ বিষয় সমূহ অন্তর্ভূক্ত হয়েছে।

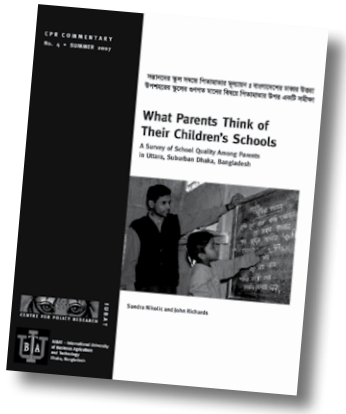
It is hard to exaggerate the importance of adequate supplies of commercial energy for the future development of Bangladesh. In May 2004, the Government of Bangladesh released a draft National Energy Policy, and invited public commentary. The government report acknowledges the serious shortcomings of present policy and the dilemmas in designing new policy.

In this third report of the Centre for Policy Research, Dr. Alimullah Miyan, Vice-Chancellor and Founder of IUBAT—International University of Business Agriculture and Technology, and Dr. John Richards, Professor at Simon Fraser University in Canada and Visiting Professor at IUBAT, respond to the draft National Energy Policy and offer a series of recommendations. The recommendations cover major issues from export of natural gas to improvements in the utilisation of biomass fuels.

CPR COMMENTARY NO. 4

What Parents Think of Their Children's Schools

A Survey of School Quality Among Parents



সন্তানদের স্কুল সম্বন্ধে পিতামাতার মূল্যায়ন ঃ বাংলাদেশের ঢাকার উত্তরা উপশহরের স্কুলের গুণগত মানের বিষয়ে পিতামাতার উপর একটি সমীক্ষা

by **SANDRA NIKOLIC,** *Planner, Health Services Authority of British Columbia, and*
JOHN RICHARDS, *Professor, Master of Public Policy Program at Simon Fraser University*

বিগত এক দশকে শিক্ষার প্রাপ্যতা বিস্তারে বাংলাদেশ প্রশংসনীয় সাফল্য অর্জন করেছে। ২০০৪ ইংরেজি সালে ১৮ মিলিয়ন শিশু, ১,১০,০০০ প্রাথমিক স্কুলে ভর্তি হয়। এতদ্সত্ত্বেও অনেক পিতামাতা তাঁদের সন্তানদেরকে বেসরকারি স্কুলে ভর্তি করান, যার ব্যয়ভার তাঁদেরকে বহন করতে হয়। আরো অনেকে বেছে নেন বেসরকারি সংস্থা কর্তৃক পরিচালিত স্কুল, যেমন ব্রাক পরিচালিত স্কুল বা মাদ্রাসা। সরকার পরিচালিত স্কুলের চেয়ে বেসরকারি পর্যায়ে পরিচালিত স্কুলের জনপ্রিয়তার মধ্যে আমরা দুটি বিষয়ের দিক নির্দেশনা দেখতে পাই যথা স্কুলের গুণগতমান সম্বন্ধে পিতামাতার উদ্বেগ এবং স্কুলে স্থান সঙ্কুলান সম্পর্কে সচেতনতা।

স্কুলের গুণগতমান সম্পর্কীয় সমস্যা সম্পর্কে পিতামাতার মনোভাব যাচাই করার জন্য, ঢাকা শহরের উত্তরে অবস্থিত উত্তরায় আইইউবিএটি-ইন্টারন্যাশনাল ইউনিভার্সিটি অব বিজনেস এগ্রিকালচার এবং টেকনোলজি'র গবেষণারত ছাত্র-ছাত্রীরা একটি জরিপ পরিচালনা করে। জরিপের ফলাফল এই প্রতিবেদনে উপস্থাপন করা হয়েছে। এই সমীক্ষায় শিক্ষার ফলাফল উন্নত করার লক্ষ্যে কয়েকটি কৌশলের মূল্যায়ন করা হয়েছে।

Over the last decade, Bangladesh has made impressive gains in the *quantity* of education available. As of 2004, there were 18 million children enrolled in 110,000 primary schools. Still, many parents choose to enrol their children in private schools where parents pay, in nonformal schools run by NGOs such as BRAC, and in madrasas. The popularity of school types other than government-run schools suggests that parents have concerns about school quality – as well as the availability of school spaces.

To assess parental attitudes to problems of school quality, student researchers from IUBAT—International University of Business Agriculture and Technology surveyed residents in Uttara, a suburb in northern Dhaka. This study reports their findings. The study also assesses broad strategies for improving education outcomes.

CPR COMMENTARY NO. 5

Barriers to Girls' Secondary School Participation in Rural Bangladesh

গ্রাম-বাংলায় মাধ্যমিক স্কুলে মেয়েদের অংশগ্রহণে প্রতিবন্ধকতা

by **JENNIFER HOVE,** *Bachelor of International Relations at University of British Columbia 2000, Master of Public Policy at Simon Fraser University 2007, Visiting Fellow, IUBAT*

বিগত ১৫ বছর মাধ্যমিক স্কুলে ছেলে-মেয়ে উভয়ের ভর্তির হার নাটকীয়ভাবে বেড়েছে। অবশ্য মেয়েদের ৬ষ্ঠ থেকে ১০ম মান পর্যন্ত লেগে থেকে পড়া শেষ করার হার হতাশাব্যঞ্জকভাবে কম। তুলনামূলকভাবে যদিও ছেলেদের টিকে থকার হারও কম। ৬ষ্ঠ মানে ভর্তির বেলায় ছেলে-মেয়ের ভর্তির হার প্রায় সমান সমান। ১০ম মান পর্যায়ে ছেলেরা মাধ্যমিক সরকারি পরীক্ষায় বিশেষভাবে মেয়েদের থেকে এগিয়ে। দশম মানের পরবর্তী উচ্চ মাধ্যমিক পর্যায়ে ভর্তির বেলায়ও ছেলেদের হারই বেশি। মেয়েদের মধ্যে যাঁরা ১০ম মান শেষ করে উচ্চ মাধ্যমিক একাদশ ও দ্বাদশ শ্রেণীতে প্রবেশ করে তাদের হার মাত্র ১৩%। স্কুল, পরিবার ও বৃহত্তর পর্যায়ে সমাজের মধ্যে এমন কিছু ক্ষমতাধর শক্তি কাজ করে যা মেয়েদেরকে স্কুলে টিকে থাকতে নিরুৎসাহিত করে। পল্লী এলাকার ৪টি স্কুলের শিক্ষক, ছাত্রী ও পিতামাতার মধ্যে সমীক্ষা চালানোর মাধ্যমে এই গবেষণায় ছাত্রীরা কেন স্কুল ছেড়ে যায় তার কারণ বিশেষণ করা হয় এবং একই সাথে কি নীতিমালা অবলম্বনে ছাত্রীদের মাধ্যমিক স্তরে স্কুল শেষ করার হার বাড়ানো যায় তার সুপারিশ পেশ করা হয়।

Over the last 15 years, secondary school enrolment rates among both boys and girls have risen dramatically. However, girls' rates of progression and completion of the secondary cycle (from grades six through ten) are disturbingly low – albeit the comparable rates for boys are also low. At grade six there is near parity between the number of boys and girls enrolled. By grade ten, boys are significantly ahead of girls in participation in public examinations and promotion to higher secondary school. Only 13 per cent of girls who complete the tenth grade transition to the higher secondary grades of eleven and twelve. There are powerful forces at work within schools, families and the broader society that dissuade girls from staying in school. Based on interview responses among teachers, students and parents in four rural schools, this study analyses why girls drop out of school, and offers policy recommendations to increase completion rates.

CPR COMMENTARY NO. 6

A New Mandate for the Rural Electrification Board

পল্লী বিদ্যুতায়ন বোর্ডের জন্য নতুন নির্দেশাবলীঃ

বিদ্যুৎ স্বল্পতা নিরসনে এলাকা-ভিত্তিক পরিকল্পনার পদক্ষেপ

by **B.D. RAHMATULLAH, NANCY NORRIS, JOHN RICHARDS**

নির্ভরযোগ্য বিদ্যুৎ অভাব বাংলাদেশের অর্থনৈতিক উন্নয়নকে দারুণভাবে বাধাগ্রস্ত করছে। বাংলাদেশের শতকরা ৭৮ ভাগ প্রতিষ্ঠান দুর্বল বিদ্যুৎ সেবাকে তাদের ব্যবসা সম্প্রসারণে প্রধান অন্তরায় হিসাবে চিহ্নিত করে।

সফল সংস্কারের ভিত্তি হলো প্রশাসনিক বিশ্বাসযোগ্যতা। বিদ্যুৎ খাতের প্রধান সংস্থাগুলির মধ্যে সবচাইতে বেশী বিশ্বাসযোগ্য হলো পল্লী বিদ্যুতায়ন বোর্ড (আর ই বি)। বিগত একদশকে আর ই বি বিদ্যুৎ সংযোগের সংখ্যা দ্বিগুণ করেছে এবং এই সংস্থা বর্তমানে বাংলাদেশে উৎপাদিত মোট বিদ্যুতের শতকরা ৪০ ভাগ বিতরণ করে থাকে। এই মনোগ্রাফের প্রণেতাগণ সুপারিশ করেন যে আর ই বি-এর ম্যান্ডেট সম্প্রসারণ করে জাতীয় গ্রীডের বাইরে স্বাধীনভাবে বিদ্যুৎ উৎপাদনের ব্যবস্থা করা। স্বাধীনভাবে বিদ্যুৎ উৎপাদনে স্বাভাবিকভাবেই এই সংস্থার সহযোগী পল্লী সমবায় (পল্লী বিদ্যুৎ সমিতি)গুলি সম্পৃক্ত হবে। উৎপাদিত বিদ্যুত অগ্রাধিকার ভিত্তিতে স্থানীয়ভাবে সহযোগী পি বি এস এর গ্রাহকদের মধ্যে বিতরণ করা হবে।

A lack of reliable electrical power is severely impeding Bangladesh economic development. Seventy-eight percent of Bangladeshi firms cite poor electricity service as a “major” or “severe” obstacle to expansion.

Successful reform requires building on a foundation of administrative credibility. The most credible of the major agencies in the power sector is the Rural Electrification Board (REB). Over the last decade, it has doubled the number of customer connections, and now distributes 40 percent of all power generated in Bangladesh. The authors of this monograph recommend an expansion of the REB mandate to enable the REB and its network of rural cooperatives (Palli Biddyut Samitee) to create generating capacity independent of the national grid, capacity whose power would be distributed on a priority basis to customers in the local participating PBS.

এই সমীক্ষায় উত্তরার তুরাগ নদী সংলগ্ন এলাকার বস্তিবাসী মহিলাদের পুষ্টিমানের একটি প্রতিবেদন তুলে ধরা হয়েছে। গবেষণাটির উপাত্ত সংগ্রহ করে আই ইউ বি এ টি— ইন্টারন্যাশনাল ইউনিভার্সিটি অফ বিজনেস এগ্রিকালচার এণ্ড টেকনোলজি-এর নার্সিং শিক্ষার্থীরা। জরিপে দেখা যায় যে অধিকাংশ মহিলার খাবারে পর্যাপ্ত পরিমাণ ক্যালরী থাকে। তবে তাদের অধিকাংশই সব শ্রেণীর খাদ্যের সুষম বন্টন থেকে বঞ্চিত। চালের মূল্যস্ফিতির কারণে হয়তবা তারা একই পরিমাণ চাল ক্রয়ের জন্য অন্যান্য শ্রেণীর খাবার বাদ দিতে বাধ্য হয়েছে।

অধিকাংশ পরিবার কোনও ধরণের বিশুদ্ধিকরণ ছাড়াই ঢাকা পানি ও পয় কর্তৃপক্ষের পানি ব্যবহার করে। ভূ-পৃষ্ঠের পানি দূষণের কারণে ওয়াসার পানিতে আশংকামুক্ত মাত্রায় রোগ-বালাইয়ের জীবানু থাকতে পারে। পরিবারের সদস্যদের মাঝে তামাক ও পানের ব্যাপক ব্যবহার লক্ষণীয়। দীর্ঘমেয়াদী ব্যবহার এই দুইটিই ভয়ানক স্বাস্থ্যহানীর কারণ হতে পারে। স্বাস্থ্যকর্মীদের কাছ থেকে প্রাপ্ত প্রত্যক্ষ উপদেশ এবং মহিলাদের স্বাক্ষরতা পুষ্টিমানের উপর ইতিবাচক প্রভাব ফেলে।

This Commentary reports on the nutritional status of shanty dwelling women in Uttara (near the Turag River). Data were collected by nursing students at IUBAT—International University of Business Agriculture and Technology. Most women have an adequate caloric intake. However, most lack adequate servings from the full range of food groups. Inflation in rice prices may have induced them to sacrifice other foods in order to maintain rice consumption.

The majority use non-boiled tap water from the Dhaka Water and Sewage Authority. Due to contamination from ground water, it may contain high levels of pathogens. Tobacco and betel nut are widely used by family members. Both pose serious health hazards if consumed on a long-term basis. The ability of women to read, and receiving one-on-one advice from a health worker had positive impacts on aspects of nutrition.

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